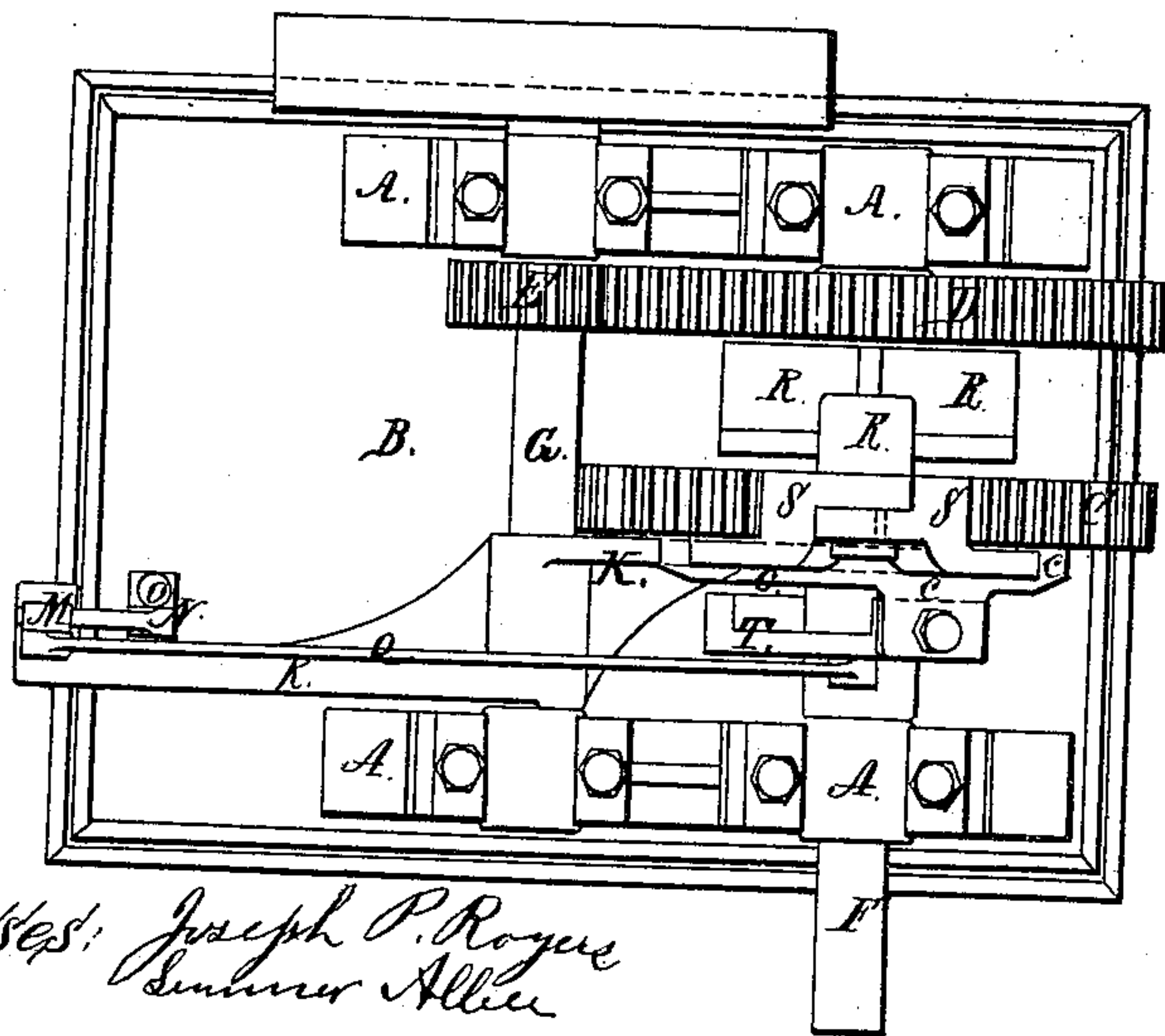
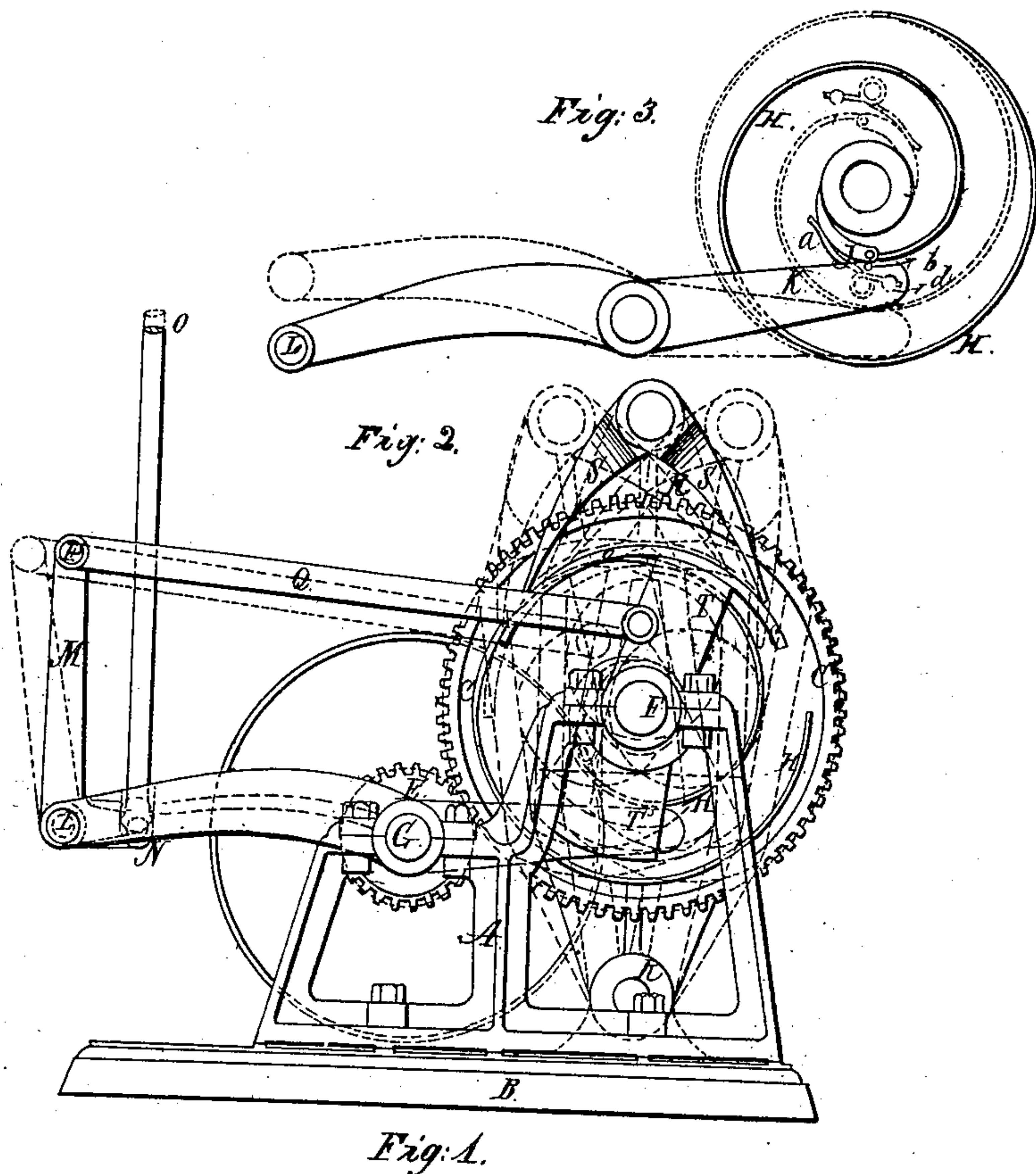


J. E. GILLESPIE.
REGULATOR FOR MOTIVE POWER.

No. 71,160.

Patented Aug. 15, 1867.



Witnesses: Joseph P. Rogers
Samuel Allen

Inventor:
J. E. Gillespie

United States Patent Office.

JAMES E. GILLESPIE, OF BOSTON, MASSACHUSETTS.

Letters Patent No. 71,160, dated November 19, 1867.

IMPROVEMENT IN REGULATOR FOR MOTIVE POWER.

The Schedule referred to in these Letters Patent and making part of the same.

Be it known that I, JAMES E. GILLESPIE, of Boston, in the county of Suffolk, and Commonwealth of Massachusetts, have invented a new and useful Improvement on a Governor or Regulator for Motive Power, and similar purposes; and I do hereby declare that the following is a full, clear, and exact description of the construction and operation of the same, reference being had to the annexed drawings, making a part of this specification, in which—

Figure 1 is a plan or top view.

Figure 2 is a longitudinal elevation.

Figure 3 is a separate view of some of the parts that most directly connect with my improvement, which consists in giving to the shield or shoe of a Scofield governor a new motion, which I will, for convenience of description, call a compound action; and I will here remark that this peculiar motion or action may be applied to other purposes than moving the gate of a water-wheel or valve of an engine, and suggest that a steering apparatus of a ship could be made to operate the helm by a similar device; and in fact any object that it may be desirable or necessary to move within fixed limits and in a variable manner, can, by the application of my improvement, be operated at the will of and in accordance to the wish of the operator.

To enable those skilled in mechanics to construct and use my machine, I will proceed to describe it in detail.

Similar letters refer to the same parts in all the figures.

B is the bed-plate. A A are the stands upon which the shafts F G rest. E, figs. 1 and 2, is a pinion on the shaft G, which is also the pulley-shaft by which the machine is driven. D is a spur-gear, working into and driven by the pinion E, and runs loose on the shaft F; its hub is made to be an eccentric, for the purpose of giving a reciprocating motion to the slotted post R R R, which is attached to the bed-plate at the lower end, and the eccentric hub of the gear D works in a slot, near its centre, which causes the top to reciprocate with a kind of rocking motion. The pawls S S are hung to the post, and thus carried with it over the teeth of the gear C, which is of the same size and pitch as D, and therefore does not show in fig. 2. C C C, fig. 1, is the shield or shoe that holds the pawls out of gear, and it is attached to the balanced lever T T, which is fulcrumed on the shaft F Q. P is a connecting-rod, reaching from the shield-lever to the right-angle lever M N. L is a stud, upon which the right-angle lever is fulcrumed. The rod O N is a connecting-rod, that may be connected at its upper end with a common ball-governor, or with any governing device that will raise or pull it up when the speed is too fast, and push it down when too slow. K K is a lever, upon which is the stud-pin L, and its fulcrum is for convenience upon the shaft G, and the lever extends into the machine, and rests upon a cam or scroll upon the gear C, the exact form of which is shown in fig. 3, H H J a b. The gear C is firmly fastened to the shaft F, and the cam H is secured to the gear. These constitute all the parts of the machine.

The operation is in all respects similar to the common Scofield governor, so far as the commencement is concerned; that is, if the fulcrum L of the lever M N were stationary, it would, in no essential respect, differ from that well-known device; but, by means of the cam H and lever K, the fulcrum is changeable, and when the governing device lifts the rod O and short arm N, as shown in red lines, thus throwing the long arm P M back, and moving the shield C T to the left, as shown in fig. 2, the fulcrum is raised by reason of the pawl S forcing the gear, and with it the cam, to the right, thus depressing the inner end of the lever K, as shown in fig. 3. It will be seen at a glance that the effect of raising the fulcrum of the right-angle lever M N is to again bring the long arm forward, and so set the shield under the pawls S S, and thus stop them from turning the shaft F until the governing device again lifts the rod O. The shaft F should be connected with the object to be moved, so that about one and a half turn shall move it from one extreme to the other; then, when the gate or valve is shut, the cam H will be in such position as to cause the lever K to be out to the outside of the cam, and when the gate is open, it will be in to the hub, where there is a latch, J, to allow it to pass under in case of misplacement, without breaking anything. If the cam is made to have more than one and a half turn, then the shaft can turn as much.

Thus it will be observed that I am able to so adjust the increase of the cam and the levers together, that a given amount of variation in the position of the rod O will always cause the gate or valve to be moved a given distance and no further, so that when the rod is raised or lowered, the gate is caused to rise or lower in proportion, the relative position at all times being maintained the same as if the moving of the rod O were really

doing the work itself, while in fact it only allows the mechanism to operate with power or force limited only by the power of the belt on the pulley. When a governing device is attached directly to the valve or gate, as, for instance, the common ball-governor applied to the steam engine, the varying and changing of position of the plane of rotation of the balls is caused to adjust the valve exactly in ratio to their own action, or rather the two are really one machine, and act together; but when the gate of a water-wheel is to be moved, the labor is so heavy that the tendency to rotate in a plane corresponding to the speed is not able to accomplish it in practice; therefore there have been many devices to overcome this difficulty, but nearly all have failed to transmit the action of the governor accurately to the gate. When large masses of machinery are in motion, and get above the normal speed, it is impracticable to instantly correct the error, but the amount of propelling force should be adjusted as quickly as possible; but when the shield of a Scofield governor is moved from under the pawls by the governing device, their action must continue until the speed again is correct before the pawls will stop their action, by which time there may have been far too much change in the gate, and the action is altogether independent of, and not in any proportion to, the change of plane of the governor, but rather in proportion to the time required to effect the momentum of the moving mass of machinery; therefore it has always been found necessary to make the action of the pawls so slow that the effect of the change of gate could have time to be felt by the governor before too much was done, thus making a very slow-acting governor.

By means of the lever K and cam H, I firmly connect the gate to the governing device through the rod O, in such manner that their relative actions closely imitate the action of the governor and valve of an engine, while the governor is released from the labor of moving the gate.

I do not wish to claim the pawls S S, or the shield T, either separately or in combination; but what I do claim, is—

1. The mode of operation whereby a compound action is given to the shield T c by means of the levers K and M N, or their equivalents, thereby causing it to be replaced in its normal position by the action of the pawls S S, without in any degree preventing it from being moved as usual by a governing device.

2. I claim the cam H and lever K, or their equivalents, in combination with a power-regulator, substantially as specified, and for the purpose set forth.

J. E. GILLESPIE.

Witnesses:

JOSEPH P. ROGERS,